

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Fufang Zha et al.
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For: METHOD OF CLEANING MEMBRANE MODULES
Examiner: Menon, Krishnan S.
Art Unit: 1797

CERTIFICATE OF TRANSMISSION UNDER 37 C.F.R. § 1.8(a)

The undersigned hereby certifies that this document is being electronically filed in accordance with § 1.6(a)(4), on the 7th day of May, 2010.

/Gregory K. Gerstenzang/
Gregory K. Gerstenzang (Reg. No. 59,513)

Commissioner for Patents

RESPONSE TO NOTIFICATION OF NON-COMPLIANT
APPEAL BRIEF UNDER 37 C.F.R. § 41.37

Dear Sir:

Pursuant to MPEP § 1205.03, this paper is filed in response to the Notification of Non-Compliant Appeal Brief mailed on April 29, 2010. Section V of the Appeal Brief originally filed on April 26, 2010 is modified herein to specifically reference each independent claim, as requested.

No fee is believed to be required for the filing of this appeal brief amendment.

V. SUMMARY OF CLAIMED SUBJECT MATTER (37 C.F.R. § 41.37(c)(1)(v))

Aspects and examples of the claimed subject matter are generally directed to methods and apparatus for backwashing a membrane filtration system wherein only permeate remaining present in the filtration system when the filtration process is stopped or suspended is used to provide liquid for backwashing the membrane pores. In one example, a method for backwashing a membrane filtration system including a vessel, a membrane module, piping, and a manifold is disclosed. The method generally involves filtering a feed liquid through pores in walls of membranes of the membrane filtration system to produce a liquid permeate, withdrawing the permeate from lumens of the membranes and through the manifold, a portion of the piping, and a valve while filtering the feed liquid, stopping the filtration process, isolating the lumens of the membranes, the manifold, the portion of the piping, and a gas inlet when the filtration process is stopped, the lumens of the membranes, the manifold, and the portion of piping upstream of the valve during filtration, wherein the lumens of the membranes, the manifold, and the portion of piping consist of those through which permeate is withdrawn while filtering the feed liquid, scouring surfaces of the membranes by flowing bubbles of a first gas past surfaces of the membranes, supplying a second gas through a second gas inlet at a pressure less than a bubble point of the membranes, applying the second gas to a portion of liquid permeate present in the isolated lumens, manifold, and portion of piping by introducing the second gas through the second gas inlet into the filtration system on a side of the valve in direct fluid communication with the membrane module, directing the portion of liquid permeate into the membrane module through a first end of the membrane module and through a second end of the membrane module, and backwashing the membranes by displacing at least some of the portion of liquid permeate through pores in walls of the membranes, the second gas not penetrating into the membrane pores. The method further involves discharging backwash waste from the vessel, refilling the vessel with feed liquid, venting the second gas from the isolated lumens, manifold, and portion of piping, and resuming filtration. (See Applicant's specification as originally filed at page 9, lines 1 -22 (paragraphs [0053] to [0058] of corresponding U.S. Patent Publication No. US2006/0261007 A1) and FIG.1)

In another example, a method of filtering solids from a liquid suspension is disclosed. The method generally involves immersing filtration membranes in the liquid suspension, filtering the liquid suspension through pores in walls of the filtration membranes, producing a liquid

permeate within lumens of the filtration membranes, drawing off liquid permeate from the lumens, withdrawing the permeate from the lumens and through a manifold and a valve, periodically suspending the filtration process, isolating the lumens, the manifold, a gas inlet, and a portion of piping when the filtration process is suspended, the lumens, the manifold, and the portion of piping upstream of the valve during filtration, wherein the lumens, the manifold, and the portion of piping consist of those through which permeate is withdrawn, directing liquid permeate present in the isolated manifold and portion of piping into the lumens through a first end of the filtration membranes and through a second end of the filtration membranes, and applying a gas at a pressure below a bubble point of the filtration membranes to the liquid permeate to displace at least some of the liquid permeate through the pores in the walls of the filtration membranes in a direction opposite to that of filtration, the gas not penetrating into the membrane pores. (See Applicant's specification as originally filed at page 3, lines 4-20 and page 9, lines 1 -22 (paragraphs [0010] – [0014] and [0053] to [0058] of corresponding U.S. Patent Publication No. US2006/0261007 A1) and FIG.1)

In another example, a method of filtering solids from a liquid suspension is disclosed. The method generally involves applying the liquid suspension to lumens of filtration membranes, filtering the liquid suspension through pores in walls of the filtration membranes, forming liquid permeate on a shell side of a pressure vessel in which the filtration membranes are mounted, and drawing off liquid permeate from the shell side of the pressure vessel. The method further involves periodically suspending the filtration process and applying a gas at a pressure below a bubble point of the filtration membranes to liquid permeate remaining within the shell side of the pressure vessel, the liquid permeate remaining within the shell side of the pressure vessel consisting of the liquid permeate formed on the shell side of the pressure vessel, to displace at least some of the liquid permeate through the filtration membrane pores in a direction opposite to that of filtration, the gas not penetrating into the membrane pores. (See Applicant's specification as originally filed at page 3, line 20 – page 5, line 5 (paragraphs [0014] to [0026] of corresponding U.S. Patent Publication No. US2006/0261007 A1.))

Respectfully submitted,
Fufang Zha et al., Appellant

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